

### **Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

Claim 1 (currently amended): A transformation engine, comprising:

an address generator;

a butterfly unit coupled to the address generator, the butterfly unit to compute fast Hadamard transform (FHT) operations;

a twiddle LUT coupled to the address generator; and

a ~~multiplexer~~ multiplier having a first input coupled to the butterfly unit and a second input coupled to the twiddle LUT.

Claim 2 (currently amended): The engine of claim 1, wherein the butterfly unit ~~computes~~ to compute fast fourier transform (FFT) operations.

Claim 3 (currently amended): The engine of claim 1, wherein the butterfly unit ~~computes~~ to compute decimation in frequency fast fourier transform (DIF FFT) operations.

Claim 4 (cancel)

Claim 5 (currently amended): The engine of claim [[4]] 1, wherein the twiddle LUT contains twiddle factors set to one.

Claim 6 (cancel)

Claim 7 (currently amended): The engine of claim [[4]] 1, wherein input data belonging to FHT samples are mapped to predetermined inputs of the transformation engine.

Claim 8 (cancel)

Claim 9 (original): The engine of claim 1, further comprising an input buffer coupled to the butterfly unit.

Claim 10 (currently amended): The engine of claim 1, further comprising an output buffer coupled to the ~~multiplexer~~ multiplier.

Claim 11 (currently amended): A method for performing a plurality of transformations, comprising:

determining a transformation operation to be performed on data; and

sharing a transformation engine between multiple transformation operations, via setting twiddle factors to one.

Claim 12 (currently amended): The method of claim 11, ~~farther~~ further comprising setting the engine to select the transformation operation.

Claim 13 (currently amended): The method of claim 11, further comprising receiving ~~the~~ an output of the transformation operation on the data.

Claim 14 (currently amended): The method of claim 11, ~~wherein~~ further comprising selecting the transformation engine can be selected to perform FFT or FHT operations.

Claim 15 (cancel)

Claim 16 (currently amended): The method of claim 11, further comprising mapping input data belonging to FHT samples to predetermined inputs of the transformation engine.

Claim 17 (original): The method of claim 16, further comprising setting remaining input data to zero.

Claim 18 (currently amended): The method of claim 11, ~~wherein the transformation engine processes~~ further comprising processing a decimation in frequency FFT operation.

Claim 19 (currently amended): The method of claim ~~[[1]]~~ 11, further comprising buffering input data and output data.

Claim 20 (currently amended): The method of claim ~~[[1]]~~ 11, further comprising decoding radio frequency channel data from the transformed data.